Features

- Improved PSRR at 217 Hz & 1 KHz 60 dB
- Power output at 5.0V, 10% THD+N, 4Ω 2.0 W (typ.)
- Power output at 5.0V, 1% THD+N, 8Ω 1.5 W (typ.)
- 2.2V – 5.5V operation
- Improved circuitry eliminates pop-click noise during turn-on and turn-off transitions
- No output coupling capacitors, snubber networks or bootstrap capacitors required
- Unity-gain stable
- External gain configuration capability
- Packages: SOP8

General Description

The 8002 is a Class-AB audio power amplifier. It is capable of delivering 2.0 watts of continuous average power to an 4Ω BTL load with less than 10% distortion (THD+N) from a $5V_{DC}$ power supply, or 1.5 watts continuous average power to an 8 Ω BTL load with less than 1% distortion.

The 8002 is designed specifically to provide high quality output power with a minimal amount of external components. It does not require output coupling capacitors or bootstrap capacitors. The 8002 is ideally suited for audio speakers and other low voltage applications.

With special pop-click eliminating circuit, the 8002 provides perfect pop-click characteristic during turn-on and turn-off transitions.

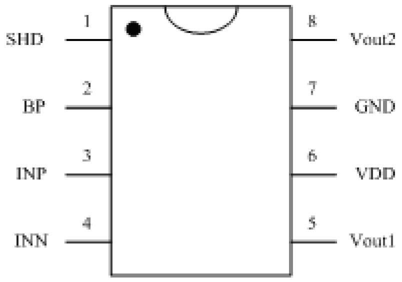
The 8002 is unity-gain stable and can be configured by external gain-setting resistors.

Applications

- Audio speakers
- Desktop computers
- Low voltage audio systems

Pin Diagrams

Mini Small Outline Package (SOP8)
(Top View)



Pin Description

No.	Pin Name	I/O	Description
1	SHD	I	Shut-down Logical Control, ‘1’ is active.
2	BP	I/O	Analog ground for inner OPAs. It’s about a half of VDD.
3	INP	I	Positive Input
4	INN	I	Negative Input
5	Vout1	O	Negative BTL Output
6	VDD	I/O	Power Supply (2.2 – 5.5 V)
7	GND	I/O	Ground
8	Vout2	O	Positive BTL Output

Typical Application Circuit

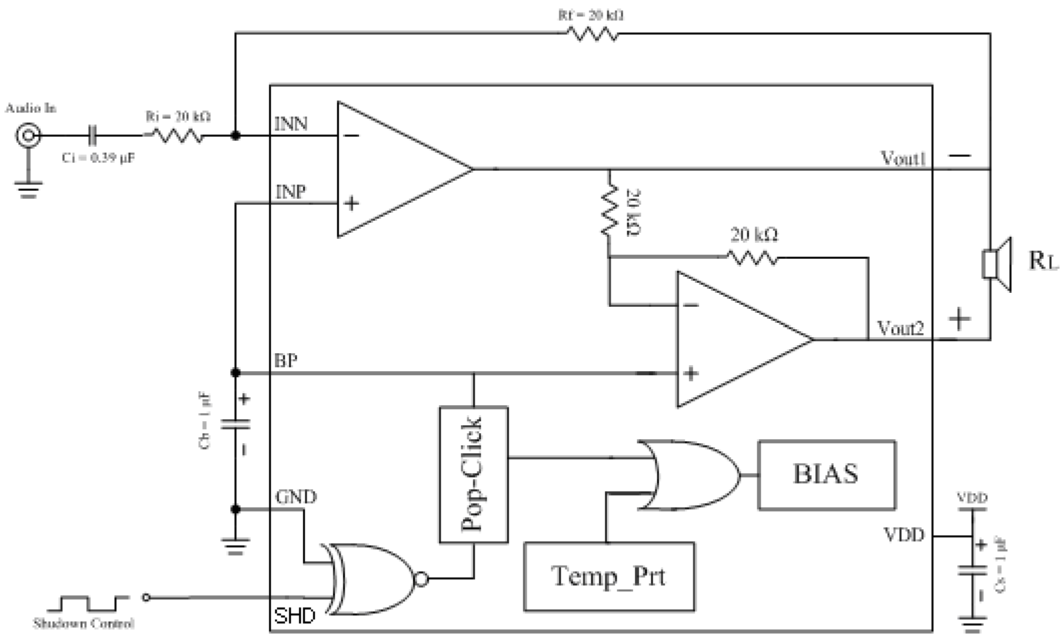


FIGURE 1. 8002 Typical Application Circuit

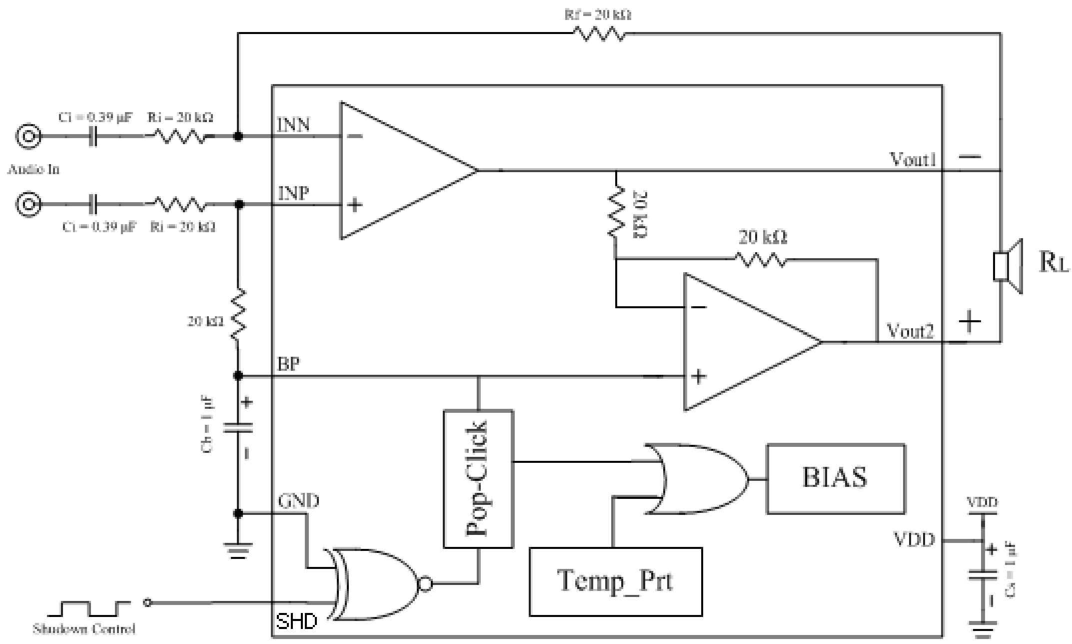


FIGURE 2. 8002 Differential Amplifier Configuration

External Components Description

Components	Functional Description
Ri	Inverting input resistance which sets the closed-loop gain in conjunction with Rf. This resistor also forms a high pass filter with Ci at fc = 1/(2πRi*Ci).
Ci	Input coupling capacitor which blocks the DC voltage at the amplifiers input terminates. Also creates a high-pass filter with Ri at fc = 1/(2πRi*Ci).
Rf	Feedback resistance which sets the closed-loop gain in conjunction with Ri. The gain is A_{VD}=2*(Rf/Ri).
Cs	Supply bypass capacitor which provides power supply filtering.
Cb	Bypass pin capacitor which provides half-supply filtering. Refer to the section.

Absolute Maximum Ratings

Supply Voltage -0.3V to 6V

Input Voltage -0.3V to VDD+0.3V

Power Dissipation

See Dissipation Rating Table

Junction Temperature -40℃ to +150℃

Storage Temperature -65℃ to +150℃

Thermal Resistance

θ_{JC}(MSOP8) 56℃/W

θ_{JA}(MSOP8) 190℃/W

θ_{JA}(SOP8) 184℃/W

Operating Ratings

Temperature Range -40℃≦T_A≦85℃

Supply Voltage 2.2V≦V_{DD}≦5.5V

NOTE: Absolute Maximum Ratings indicate limits beond which damage to the device may occur. Operating Rating indicate conditions for which the device is functional, but do not guarantee specific performance limits.

Electrical Characteristics

The following specifications apply for the circuit shown in Figure 1, unless otherwise specified. Limits apply for T_A = 25℃.

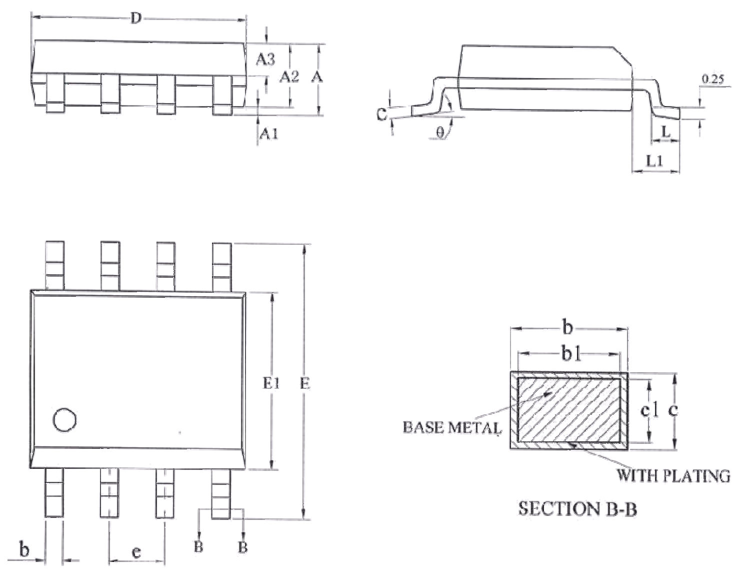
❑ **V_{DD} = 5V**

Symbol	Parameter	Conditions	Spec			Units
			Min.	Typ.	Max.	
I_{DD}	Quiescent Power Supply Current	V_{IN} = 0V, 8Ω Load		3.0	8	mA
		V_{IN} = 0V, No Load		2.5	7	mA
I_{SD}	Shutdown Current	V_{IN}=0V, V_{SHD}=GND, No Load		0.5		uA

V_{SDIH}	Shutdown Voltage Input High		1.2			V
V_{SDIL}	Shutdown Voltage Input Low				0.9	V
V_{OS}	Output Offset Voltage		-50	6	50	mV
THD+N	Total Harmonic Distortion+Noise	Po=0.5Wrms, f=1KHz,		0.07		%
P_O	Output Power	THD+N<=1%, f=1KHz, 8Ω Load		1.5		W
P_O	Output Power	THD+N<=10%, f=1KHz, 4Ω Load		2.0		W
PSRR	Power Supply Rejection Ratio	Input terminated with 10Ω, $V_{DDRIPPLE}$=0.2V_{P-P}, f=217Hz		60		dB
		Input terminated with 10Ω, $V_{DDRIPPLE}$=0.2V_{P-P}, f=1KHz		61		dB
T_{WU}	Wake-up time			100		ms

❑ **V_{DD} = 3V**

Symbol	Parameter	Conditions	Spec			Units
			Min.	Typ.	Max.	
I_{DD}	Quiescent Power Supply Current	V_{IN} = 0V, 8Ω Load		2	7	mA
		V_{IN} = 0V, No Load		1.5	6	mA
I_{SD}	Shutdown Current	V_{IN}=0V, V_{SHD}=GND, No Load		0.5		uA
V_{SDIH}	Shutdown Voltage Input High		1.0			V
V_{SDIL}	Shutdown Voltage Input Low				0.7	V
V_{OS}	Output Offset Voltage		-50	6	50	mV
THD+N	Total Harmonic Distortion+Noise	Po=0.25Wrms, f=1KHz,		0.08		%
P_O	Output Power	THD+N<=1%, f=1KHz, 8Ω Load		350		mW
PSRR	Power Supply Rejection Ratio	Input terminated with 10Ω, $V_{DDRIPPLE}$=0.2V_{P-P}, f=217Hz		57		dB
		Input terminated with 10Ω, $V_{DDRIPPLE}$=0.2V_{P-P}, f=1KHz		58		dB
T_{WU}	Wake-up time			75		ms



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	—	—	1.77
A1	0.08	0.18	0.28
A2	1.20	1.40	1.60
A3	0.55	0.65	0.75
b	0.39	—	0.48
b1	0.38	0.41	0.43
c	0.21	—	0.26
c1	0.19	0.20	0.21
D	4.70	4.90	5.10
E	5.80	6.00	6.20
E1	3.70	3.90	4.10
e	1.27BSC		
L	0.50	0.65	0.80
L1	1.05BSC		
θ	0	—	8°

SOP8